WHAT IS CLAIMED IS:

1. A method of grouping image data points based on smoothness or roughness values, the method comprising:

creating a reduced-dimensionality image data set from a multidimensional image data set;

selecting a first set of points in the reduced-dimensionality image data set, each point in the first set of points having a corresponding point in a second set of points in the multidimensional image data set;

defining a unique projection path for each point in the first set of points, the projection path extending in a direction Z from a point in the first set of points through the corresponding point in the second set of points;

determining a distance measure for a first point in the first set of points, the distance measure being the distance along the projection path in the Z direction between the first point in the first set of points and the first point's corresponding point in the second set of points;

determining the distance measures for multiple points, including an image point, in the first set of points;

calculating a smoothness or roughness value for the image point in the first set of points by comparing the distance measure of the image point to the distance measures of other points in the first set of points; and

grouping the image point with similar points in the first set of points, each of said similar points having both a smoothness or roughness value related to the smoothness or roughness value of the image point.

2. The method according to Claim 1, wherein the smoothness or roughness value of the image point is determined using a least squares fit of the distance measures of points in proximity to the image point.

3. The method according to Claim 1, wherein a Z-buffer array comprises the distance measures of multiple points in the first set of points.

4. The method according to Claim 1, further comprising converting grouped and ungrouped points into a multi-dimensional image.

5. The method according to Claim 4, further comprising performing region growing within the multi-dimensional image.

6. The method according to Claim 5, further comprising hollowing out the multi-dimensional image.

7. The method according to Claim 6, wherein the hollowing out comprises removing each pixel from a group that is surrounded on each side by a pixel from said group.

8. The method according to Claim 1, further comprising displaying an image of grouped and ungrouped image points.

9. The method according to Claim 1, wherein the multidimensional image data set is a magnetic resonance derived image set.

10. The method according to Claim 1, wherein the multidimensional image data set is a computed tomography derived image set.

11. The method according to Claim 1, further comprising compensating for variations in sensitivity along projection paths to enhance a projection image.

12. The method according to Claim 3, further comprising applying a process to the buffer array to enhance the Z buffer array based upon expected properties of adjacent points in the buffer array.

13. The method according to Claim 12, wherein the process comprises measuring array element roughness in a plurality of directions around each array element in the Z buffer array.

14. The method according to Claim 1, wherein the projection paths are curvilinear.

15. The method according to Claim 1, wherein the projection paths are divergent from a point of origin.

16. The method according to Claim 1, wherein the proximity is defined as being no more than two image element positions from the image point.

17. The method according to Claim 1, wherein the proximity is based on point adjacency.

18. The method according to Claim 1, further comprising manipulating image groups for enhanced display.

19. The method according to Claim 18, wherein the image manipulation consists of hollowing image structures.

20. The method according to Claim 19, wherein the hollowing step comprises removing voxels in a group that are surrounded in multiple directions by adjacent voxels in the same group.

21. The method according to Claim 1, further comprising displaying a resulting image.

22. The method according to Claim 21, wherein the display comprises summation of the multi-dimensional image along projection lines.

23. The method according to Claim 21, wherein the display comprises shading volume surfaces.

24. The method according to Claim 1, further identifying bifurcations or branches of groups segmented from the multidimensional image.

25. The method of Claim 1, wherein a corresponding point in the second set of points comprises a maximum intensity value along the corresponding point's projection path.

26. The method of Claim 1, wherein a corresponding point in the second set of points comprises a minimum intensity value along the corresponding point's projection path.

27. The method of Claim 1, wherein a corresponding point in the second set of points comprises a value above or below a predefined value.

28. The method of Claim 27, wherein the corresponding point in the second set of points comprises an intensity value above an average background value.

29. The method of Claim 28, wherein the corresponding point in the second set of points comprises an intensity value more than two standard deviations above the average background value.

30. The method according to Claim 1, wherein the smoothness or roughness value of the image point is determined using chi-square values of the fit of the distance measures of points in proximity to the image point.